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EDITORIAL

HAZLITT, in one of his essays, remarked that editors are " a sort of kittle-kattle " —difficult to deal with, dangerous to discuss—and that it is utterly impossible to persuade an editor that he is nobody. What editor, he asks, would insert an article against himself? And proceeds to leave the one who does no shred of respect by the answer that he would need to feel himself superior to the common foibles of his tribe. The best that Hazlitt could say was that editors in general partake of the usual infirmity of human nature; we prefer to feel that those who know the worst would like to spare our feelings by a decent silence, and that those who have an itch to seek it would rather do so in the privacy of their own shelves. For those who want a little entertainment at the editor's expense Hazlitt's essay is a gem. For he has both the spice of wit and the touch of malice to lay the self-importance of the fellow in ruins. It is, of course, an essay that no editor should ever read; it is the kind that, for him, precipitates neurosis or a hasty resignation—or, perhaps, an even firmer use of the blue pencil at the earliest opportunity.

But we like to think of the editor's position in other terms. Hazlitt himself pointed out that in every periodical there are two essential parties—the writers and the public. The editor and the printer's devil are merely the mechanical instruments to bring them together. In this respect we believe that 1943 saw this Journal working well; we hope that 1944 will see a still better output of high standard. Restrictions may curtail the size of this as of other journals; they can never impair its quality. And the brevity of a work in print, after all, is often its most certain assurance of being read and of retaining a place in memory. That we have been able to keep a specialised Journal not only alive but flourishing through four years of war is a matter for congratulation much more to those who have been its contributors and readers than to the staff who have merely served the courses. All that we have done is to keep reasonably up to date with publication. It is possible now to see more clearly to the time when journals will again serve the needs of peacetime practice, and when the flow of research will cease to be impeded by the overriding needs of daily routine.

Turning to the present number, we are glad to have the opportunity of giving an account of the new unit at Sidcup for the care of patients with pleural effusions. Whatever difficulty may obtain with the individual patient in establishing the cause, there is little doubt that the vast majority are tuberculous; and experience among those who are fortunate enough to be well advised and

82220

XUM

to have the unimpeded leisure for a lengthy convalescence has long since shown that the outlook is excellent, granted these essentials. Without these essentials the subsequent story is apt to be a very different affair. Progressive pulmonary lesions are a common sequel within a matter of a few years, and with all the drawbacks that arise from an adherent, and sometimes still inflamed, pleura. Robson in his recent Goulstonian Lectures surveyed the ground in the light of recent figures, and he showed that the early and continuous care and supervision of these patients is the only way by which a risk of disastrous invalidism can be avoided. The importance of this approach to the subject is not yet sufficiently appreciated: of two recent cases seen by the writer one had been regarded as fit for a return to nursing duties with the Army within six months of an effusion, and the other as fit for whole-time secretarial work in about the same time although parenchymal disease was then present in radiographs, which were not seen by the medical man who gave the opinion.

Fortunately that kind of error is not common, though it ought not to be made at all. Far more important as a source of risk is the stress of economic circumstance, the premature return to work under unsuitable conditions. In an imperfect world and in war-time we cannot ask for the moon for our patients; but it is greatly to the credit of those responsible that such a long-sighted measure as the Sidcup unit should have been launched at this time, coupled with the financial provisions of Memorandum 266T. The continuity of supervision, the graded return to work, the provision of a favourable environment for long enough without the drawbacks of sanatorium treatment, and the relief from monetary worries are more likely to be fulfilled by a conjoint scheme of this kind than ever before for a class of patient for whom, hitherto, it has usually been impossible to provide the combination of circumstances so necessary to permanent recovery.

We wish the unit and those in charge of it every success with their plans, and hope that the example may be followed elsewhere.

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GENERAL ARTICLES

TUMOURS OF THE DIAPHRAGM
WITH REPORT OF A DIAPHRAGMATIC CYST

By KENNETH ROBSON and J. LEIGH COLLIS,
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Tumours of the diaphragm are sufficiently rare to warrant reporting a single case. There is, however, an added reason for their consideration at the present time, for the increasing use of mass radiography will doubtless lead to the discovery of further cases presenting difficulties in diagnosis, prognosis and treatment.

Case Record

D. A., a leading aircraftsman, aged 22, was transferred to an R.A.F. Hospital on February 9, 1943, from a sanatorium in the South of England for investigation. He had had pain in the right side of his chest since November, 1942. Pulmonary tuberculosis had been excluded at the sanatorium. The pain came on with deep breathing and was made worse by exercise. He had noticed some shortness of breath, and stated that he had lost a stone in weight since the onset of the pain. He had no cough and had had no hæmoptysis. After a month's observation in a hospital in the North of England the previous April a diagnosis of bronchitis had been made. An oval shadow had been noted in a radiogram of the right base at this time, but it was not possible to obtain this film.

At the age of four he had pneumonia, and had always been subject to colds. One brother had died of pulmonary tuberculosis at the age of 23, and his mother had died following an hæmoptysis.

On examination he appeared to be a healthy young man with no abnormal physical signs. His weight was 11 stone 10 pounds. Radiograms (Figs. 1 and 2) were taken of his chest, including oblique views, and these showed an oval shadow adjacent to the posterior part of the right diaphragm. This shadow was barely perceptible in the P.A. view, and its discovery was originally made at routine fluoroscopy. The shadow was homogeneous except for a fine stippling in the lower part. The radiologist suggested that this stippling indicated that the opacity was cystic, containing fluid and calcareous deposit which had sunk to the lower part. The patient's blood sedimentation was $\frac{2}{200}$ mm. Westergren, a Casoni test was negative, and the blood count was within normal limits except for a total white cell count of 15,600. He ran a low-grade evening pyrexia (up to 99° F). An attempted initial right pneumothorax showed that the right pleural cavity was obliterated by adhesions.

After consultation between the authors and with the help and advice of Mr. Tudor Edwards it was decided to remove the tumour. An exact diagnosis could not be made, but it was thought that the tumour was either a dermoid or a chondroma. Following his transfer to an E.M.S. Chest Unit a thoracotomy

XUM

was performed on March 29, 1943, under local anæsthesia. Portions of the tenth and eleventh ribs were removed and the obliteration of the pleural cavity was confirmed. The tumour, about the size of a pullet's egg, was readily separated from the lung and chest wall, but it was only possible to remove it from the diaphragm by cutting through the muscle fibres. The wound was closed and the patient made an uninterrupted recovery.

The tumour was found to be cystic, containing a thick, white viscous mass in which was a small quantity of solid sandy material. Microscopically these contents were amorphous, with some cholesterol crystals and a few degenerated leucocytes. No organisms were found microscopically or on culture. Chemical analysis revealed the following:

Water		53·31 per cent.
Total solids		46·69 ,,
Protein	7·11 per cent.	
Non-protein nitrogen	0·14 ,,	
Cholesterol	0·64 ,,	
Fat	4·56 ,,	
Ash	26·55 ,,	
Total	39·00 ,,	

The ash contained mainly calcium phosphate, and the discrepancy between 39 per cent. and the total solids given as 46·69 per cent. is due to the escape of CO_2 in ignition.

The wall of the cyst was macroscopically about 0·25 cm. thick. It was shaggy on the outside from adhesion to surrounding structures, but on the inside it was smooth. Microscopically (Fig. 3) it consisted of fibrous tissue with many small bloodvessels and was lined internally by granulation tissue. No definite tubercle follicles or giant cell formations could be found.

Though the exact nature of this cyst is uncertain, it seems most likely that it was tuberculous in origin.

Discussion

A search of the literature has produced twenty-one reported examples of diaphragmatic tumour. These are briefly summarised below with our own case added:

SIMPLE TUMOURS.

Author.	*Sex.*	*Side.*	*Age.*	*Diagnosis.*	*Symptoms.*
Granché	M.	—	—	Fibroma	Not stated
Clark	F.	Rt.	65	Lipoma	None
Kramer	M.	—	54	Chondroma	None
Bonamy	F.	Rt.	34	Multiple fibromata	Swelling—no pain
Holmes and Brody	M.	Rt.	50	Angiofibroma	None
Gravano	—	Rt.	—	Benign tumour*	Not stated
Spangenberg, Gattini and Sloer	M.	Rt.	73	Benign tumour†	Bronchitis
Ballon and Spector	F.	Lt.	45	Lipoma	None
Söderlund	F.	Lt.	50	Lipoma	Pain
Authors	M.	Rt.	22	Cyst	Pain on respiration

* X-ray evidence only. † No post-mortem.

PLATE I

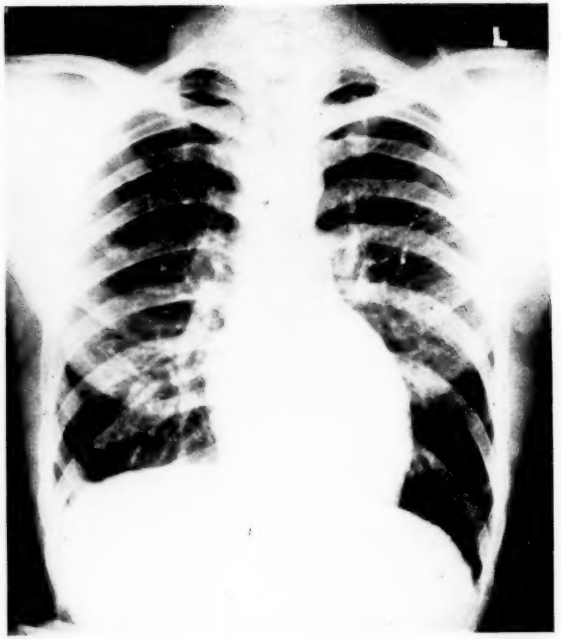

FIG. 1.

This radiogram shows the difficulty experienced in this case of finding any abnormality in the standard P.A. view of the chest.

FIG. 2.

An oblique view of the right side of the chest demonstrates the opacity in the costo-phrenic angle. The more radio-opaque material in the lower part of the cyst is also discernible. This was taken to indicate that the structure was cystic with fluid contents.

[*To face page* 4.

PLATE II

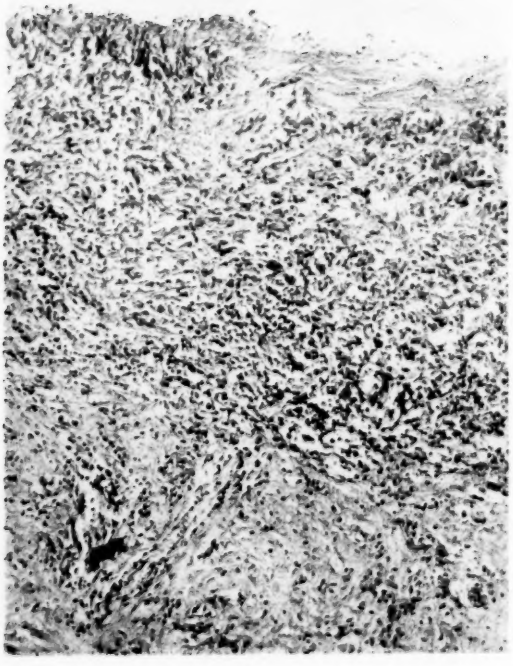

FIG. 3.

[*To face page* 5

MALIGNANT TUMOURS.

Author.	*Sex.*	*Side.*	*Age.*	*Diagnosis.*	*Symptoms.*
Dalzell	F.	Rt.	42	Sarcoma	Cough
Alexander	—	—	—	Fibrosarcoma	Not stated
Sauerbruch	F.	Lt.	43	Fibromyosarcoma	Abdominal pain
Van Nes	F.	Lt.	65	Fibrosarcoma	Abdominal pain
Müller	F.	Rt.	45	Myoblastic sarcoma	None
Kirschbaum	M.	Lt.	58	Leimyosarcoma	Pain, dyspnœa
	M.	Rt.	47	Rhabdomyosarcoma	Pain, cough—hæmoptysis
Ryan	—	—	—	Myosarcoma	Not stated
Peery and Smith	M.	Rt.	14	Rhabdomyosarcoma	Pain on deep respiration—dyspnœa
Hyman and Ledner ..	F.	Rt.	73	Fibrosarcoma	Œdema of legs
Ackerman	M.	Rt.	27	Fibrosarcoma	Pain and dry cough
	M.	Rt.	48	Unknown*	Pain sometimes severe

* No post-mortem.

Ætiology.—From the above it will be seen that 4 cases occurred in females and 10 in males. Ten were simple and 12 malignant. The right side appears the more frequently affected, with 13 recorded instances on this side against 5 on the left. The age of the patients varied between fourteen and seventy-three years. The highest incidence is apparently in later adult life.

Decades:	*1st.*	*2nd.*	*3rd.*	*4th.*	*5th.*	*6th.*	*7th.*	*8th.*	*9th.*
Number of recorded instances ..	0	1	2	1	6	4	2	2	0

Pathology.—The pathology of the tumour is stated in 19 cases, and in 14 of these the growth originated either in muscle or fibrous tissue. This is to be expected with muscle and fibrous tissue the main components in the structures of the diaphragm. Of the remaining 5 cases, 3 were fatty tumours, 1 a chondroma, and 1 a cyst.

Clinical Findings.—Symptoms have usually been mild, though they were present in 13 of the 17 patients in whom a record of the symptomatology is available. It is possible that the long period of ill-health in the present case represented a phase of constitutional disturbance due to the tumour. Pain is the most common complaint and is mentioned nine times. Cough and shortness of breath are also noted. Abnormal physical signs are generally absent, but radiography (including oblique views) is of the greatest value in visualising the tumour. The importance of oblique views is brought out particularly by the present case, while the help obtained from radiograms after a pneumothorax or a pneumoperitoneum has been mentioned by Söderlund. Regular screening of all obscure cases of pleuritic pain is a wise plan; it led to the discovery of the tumour in the present instance.

Treatment.—It is certainly difficult to know whether to advise operative intervention when a small lump is found which is causing either minor symptoms or no symptoms at all. The fact that half the recorded cases have been

XUM

found to be malignant tumours will naturally weight the balance in favour of early exploration, while the uneventful recovery of the four cases treated surgically shows that the operation need not be feared. It is to be noted, however, that Sauerbruch's was the only malignant tumour to be removed successfully.

Summary

1. A cyst of the right side of the diaphragm is recorded, with successful removal.

2. A survey of the literature revealed 21 previously recorded cases of tumours of the diaphragm. About half of them have been malignant, and of these 1 only has been removed successfully. Simple tumours have proved to be more amenable to removal; and on this account exploration is generally advisable.

Our thanks are due to the Director-General, Medical Services, R.A.F., and the Director-General of the E.M.S. for permission to publish this case. We should also like to thank Mr. W. J. Pardoe of the Anatomical Department of the Birmingham University for his excellent photographic work, which was made possible through the courtesy of Dr. C. F. V. Smout, acting Professor.

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CARDIAC ARRHYTHMIA IN BRONCHIAL CARCINOMA

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LITTLE attention seems to have been drawn to the occurrence of cardiac irregularities with bronchial neoplasms. Kamerling and van Nieuwenhuizen (1936) reported this abnormality in 8 out of 36 cases of pulmonary tumours which they observed; of these, 6 had paroxysmal auricular fibrillation,

1 paroxysmal tachycardia of sinus origin, and 1 paroxysmal ventricular tachycardia. Having found in some cases evidence of sympathetic stimulation (exophthalmos and dilated pupil) and in others post-mortem evidence of involvement of a vagus nerve with growth, these authors postulated autonomic irritation as the cause of the arrhythmia.

From evidence which has gradually accumulated as a result of studying the cases now reported, it is considered that a different mechanism may equally well, if indeed not more frequently, account for such arrhythmias.

Case Reports

Case 1.—I.C., male, aged 59, complained of pain in the right arm, cough and shortness of breath of four months' duration. He showed signs of marked obstruction to the superior vena cava, a right Horner's syndrome, and collapse of the left lung. He also had fibroid tuberculosis at the right apex with a positive sputum; the diagnosis of left bronchial carcinoma was made in addition. During the last six weeks of his life several paroxysms of premature systoles were noted. The relevant autopsy finding was a mass of secondary growth in the mediastinal glands invading the muscle of the left auricle.

Thereafter, cases diagnosed as bronchial carcinoma were carefully watched for the presence of any cardiac arrhythmia, and the following examples were observed:

Case 2.—N.B., female, aged 62, had suffered from lassitude, loss of weight, anorexia and dyspnœa with some cough for six months before admission. During four months' observation before death, two paroxysms of auricular flutter (2 : 1 block, regular ventricular rate 166, proved by cardiogram) and six paroxysms of auricular fibrillation (proved once by cardiogram) were observed. At post-mortem there was growth in the right upper lobe bronchus spreading extensively to the hilar and mediastinal glands and invading the walls of both auricles, particularly the right.

Case 3.—E.H., male, aged 51, gave a seven months' history of dyspnœa, cough, hæmoptysis and pain in the right chest; signs were those of fluid overlying a collapsed right lung, with mediastinal obstruction. Auricular fibrillation, apex rate 120, was also present, but normal rhythm returned after five days' full dosage with digitalis, which was discontinued. The arrhythmia recurred a few days before death three weeks later. Autopsy showed extensive invasion of the superior vena cava and left auricle from malignant glands secondary to a growth in the right main bronchus.

Case 4.—A.I., male, aged 37, came under observation for deep X-ray therapy with a bronchial carcinoma proved by thoracotomy, which had shown "growth in the right lower lobe invading the pericardium over the right auricle and probably the auricle itself also." Paroxysmal auricular fibrillation was noted over a month before operation, and continued during the three months that the patient remained in hospital. Follow-up by letter eleven months after operation revealed that the patent was still alive, though bedridden for four months, and having frequent "heart attacks," so that the fibrillation was probably still paroxysmal. This is the same patient mentioned in an article by Rusby and Thompson (1943).

Case 5.—F.C., male, aged 52, had a right lower lobe bronchial carcinoma proved by biopsy. During deep X-ray therapy a broncho-œsophageal fistula formed, barium swallow filling the right lower lobe bronchus. For three weeks

XUM

he had paroxysms of auricular fibrillation and was ultimately taken home by his relatives in a moribund condition, so that no autopsy was made.

Case 6.—C.T., male, aged 66, had an old right hemiplegia; for the previous two months he had had cough, hæmoptysis and pain in the left chest. He suffered from hypertensive cardiovascular disease, B.P. 200/130, and during the last four days of his life he had two paroxysms of auricular fibrillation; the X-ray appearances were somewhat suspicious of bronchial carcinoma, although the diagnosis remained in doubt until post-mortem. Growth was found around the left upper lobe bronchus creeping down to the pericardium over the left auricle but not invading the muscle; it had produced a hæmorrhagic and plastic pericarditis.

Case 7.—D.B., female, aged 49, was the only other patient who was discovered in retrospect to have any relevant abnormality. Autopsy had shown primary neoplasm of the left lower lobe bronchus with glandular metastasis involving the left auricle. During four weeks' observation she had a constant regular tachycardia between 136 and 154 per minute. As she was markedly anæmic (Hb. 48 per cent.) and her temperature swung between 99° F. and 101·6° F., the pulse rate at the time was evidently not considered to be of peculiar pathological significance, and an electro-cardiogram was not made; but in view of the post-mortem findings and the fact that her tachycardia had not varied proportionately to the changes in temperature, it may well have been a manifestation of malignant cardiac involvement.

Commentary

In these seven cases of primary bronchial carcinoma some abnormality of the pulse was noted (1 of paroxysmal premature systoles, 4 of paroxysmal auricular fibrillation, 1 with paroxysms of both auricular flutter and fibrillation, and 1 of persistent regular tachycardia (? flutter). Five came to post-mortem examination, and of these three (Cases 1, 3 and 7) showed invasion of the left auricle with growth, one (Case 2) had both auricles involved, and the fifth (Case 6) had growth invading the pericardium, although here the arrhythmia was associated with hypertensive cardiovascular disease in addition.

In Case 4 it had been found at thoracotomy that growth was involving the right auricle, and Case 5 presented strong presumptive evidence of invasive neoplasm in this region as a wide fistula developed between the right lower lobe bronchus and the œsophagus. No other patient in an unselected series of 66 bronchial neoplasms showed any notable cardiac arrhythmia or inexplicable tachycardia.

The findings point to direct involvement of an auricle as the cause of the irregularity in Cases 1-5, and of the persistent regular tachycardia in Case 7; there were 46 further autopsies in the series, which revealed 2 more cases with malignant invasion of an auricle, 1 of the left ventricle, and 2 of the pericardium.

Of the total of 8 cases in which an auricle was affected, the primary neoplasm was right sided in 6, left sided in 2; histologically it was squamous in 5, oat-celled in 2, and undetermined in the other.

This complication is, therefore, not so very rare; it occurred in 12 per cent. of 66 cases diagnosed as bronchial carcinoma, of which 51 were proved by autopsy; 5 of them suffered with paroxysmal cardiac arrhythmia, and 1 with a per-

sistent regular tachycardia, for periods varying from three weeks to over one year before death, so that the incidence of some abnormality of the pulse was about one in ten, or three-quarters of those with auricular involvement by growth.

These views are therefore in disagreement with the theory of Kamerling and van Nieuwenhuizen (1936) previously mentioned. In any case with extensive neoplastic involvement of the mediastinum a vagus nerve is very liable to damage, but from an anatomical standpoint the auricles are also vulnerable, especially the left auricle, being in close proximity to the right lower lobe bronchus and the right hilar and mediastinal glands. Vagal involvement probably occurs in many cases without any cardiac manifestations, and invasion of an auricle is also found at autopsy when there has been no clinical suggestion of such a lesion. It need not be emphasised here that bronchogenic growths are not the only ones which may be guilty of such invasion; while the present series was being collected, however, only one other such case was found causing arrhythmia, this being a mediastinal lymphosarcoma with auricular fibrillation.

Without attempting to draw set conclusions from a small series, it is felt that the application of the present findings to clinical work could be twofold: that in a known case of bronchial carcinoma the occurrence of cardiac arrhythmia for no other evident reason indicates inoperability; and that in pulmonary lesions particularly of the right lung, suspected of being malignant, the presence of such arrhythmia would support such a diagnosis or in rare cases might even draw attention to it.

Summary

1. Bronchial carcinoma not infrequently produces malignant invasion of auricular muscle; of 66 unselected cases in the present series, this occurred in 8.

2. Seven cases are briefly reported which presented some abnormality of pulse rate or rhythm; this was considered to be due to direct auricular involvement in all but one case.

3. It is suggested that arrhythmia in bronchial growths may be of some diagnostic importance, particularly as indicating inoperability.

I am grateful to Surgeon Rear-Admiral H. W. Whiteside for permission to publish this paper; and to Dr. C. E. Lakin, Dr. Alice Ross, Dr. G. E. S. Ward and Dr. I. G. Williams for use of their cases.

I am greatly indebted to Dr. I. Doniach for the most careful pathological investigations.

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XUM

THE MANAGEMENT OF PLEURISY AND PLEURAL EFFUSION CASES

By F. R. G. HEAF and CLIFFORD HILLINGWORTH,
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Pleurisy, pleural effusions and minimal lesions of pulmonary tuberculosis are disabilities which demand special consideration in diagnosis, treatment and rehabilitation. In many instances the nature of the lesion is doubtful, the necessary duration of treatment indefinite, and the return to normal life and work either too rapid or too slow. To secure a correct balance in all these matters, it is necessary to review each case individually with care and with due regard to all social, economic, and environmental factors. Often the limited extent of the lesion and the absence of persistent or even transitory symptoms makes it doubtful whether it is necessary to notify the patient as suffering from tuberculosis; on the other hand, the frequency with which definite pulmonary tuberculosis is preceded by pleurisy makes it essential that each case is followed up for a number of years by physicians who will appreciate at an early stage the presence of serious developments. Notification facilitates this and gives the Tuberculosis Officer opportunity to make full investigations.

Because of the peculiar nature of these lesions the L.C.C. established early in 1942 a unit which has now 130 beds at the Queen Mary Convalescent Hospital at Sidcup for the observation, treatment, and assessment of patients suffering from pleurisy, pleural effusions and minimal lesions of pulmonary tuberculosis. One advantage of placing the unit at a convalescent hospital is that the patients escape the stigma of having been at a sanatorium. No case is allowed to remain at Sidcup which shows progressive pulmonary involvement. Cases with sputum or post-primary parenchymatous lesions are not admitted. Every effort is made to regard the disability as one which can have serious consequences, and patients are submitted to a thorough investigation to establish a correct diagnosis and to sufficient treatment to avoid premature return to work. Such routine gives rise to many problems, which may be grouped under Diagnosis, Treatment and Rehabilitation.

Diagnosis

Routine X-ray examinations, B.S.R. and skin tests are done in all cases, and where the diagnosis is in doubt a gastric lavage is performed; so far, in 4 out of 40 of these cases a positive result has been obtained. In the large majority of cases, therefore, no assistance has been obtained from this method. Careful attention is paid to history of contact both in the home and at work; in fact, the diagnosis sometimes rests on this factor. Previous illnesses are important, and the elimination of chronic sinus trouble in cases with vague pulmonary shadows has been found to be necessary. The patch test is used in the first instance on all cases and followed, if there is no reaction, by Mantoux

$\frac{1}{1000}$ and $\frac{1}{100}$. The main points on which a diagnosis of tuberculosis has been made, apart from direct pathological evidence and cytology of effusion, are:

1. Positive family history or direct contact.
2. History of erythema nodosum or phlyctenular conjunctivitis.
3. Sudden onset without history of pneumonia or rheumatism.
4. The chronicity of the effusion (although rapid absorption does not exclude a tuberculous origin).
5. The presence of tuberculous infiltration in the lung parenchyma. This may be very slight, but should always be sought in good normal and penetrative X-ray films taken in anterior, posterior, oblique and lateral positions.
6. Continued raised pulse rate, although resting in bed.
7. The onset of an effusion for no apparent cause in the presence of tuberculous infiltration of hilar glands.

It is not suggested that any one of these criteria establishes a diagnosis, but a combination of a number of them is sufficient to warrant a diagnosis of tuberculosis.

Treatment

Each case is given an initial period of at least six weeks' rest in bed even though the pulse rate and temperature range are within reasonable limits. In cases where these are varied, rest in bed is continued until they have been normal for at least two weeks. Considerable persuasion is needed to convince the patient that this is necessary, and success depends very largely on the tact and resourcefulness of the ward sister and her staff. Knitting and light handicraft work which can be done in bed is encouraged and does much to keep the patients contented. Following this period of rest the patient is allowed to get up gradually for extending periods, and when up four hours is given productive work, such as assembling wireless parts and minor mechanical devices. Nurses are allowed to do light ward duties and walking exercises are introduced. When up all day, the patient is advised to take a period of "hardening off" at an industrial settlement, particularly if his normal occupation is of a strenuous nature. This advice is not often taken for two reasons. Firstly, the patients are usually feeling very fit and have the prospect of good remunerative work which can be easily obtained in wartime, and, secondly, they object to a transfer to another institution where they know they will be submitted to further intensive investigations by a staff of doctors with whom they are not acquainted. Sometimes a compromise has to be effected and the patient is sent to a seaside convalescent home for about six weeks. Probably this hardening off process will be made easier when the abnormal demand for man-power ceases after the war. It is an advantage to arrange for an encouragement payment in the form of pocket-money to be granted to all patients doing useful work, so that the incentive and confidence to earn a satisfactory income in the future is maintained. This practice of providing work not only has a marked psychological value; it is also a test of the employability of the individual and gives some indication of the capacity for work after discharge. In the future it may be possible to supplement this trial

XUM

with physiological tests which will indicate the muscular efficiency of the patient, so that he can be advised with reasonable accuracy as to the type and kind of work he is suited for when he finally returns to normal life.

In uncomplicated cases, aspiration of the effusion is only resorted to if it is causing respiratory embarrassment, the mediastinum is considerably displaced, or the absorption is unduly slow and is causing symptoms of continued mild toxæmia. In the latter case a withdrawal of about 200 to 300 c.c. often stimulates absorption. Patients in whom all signs of activity have disappeared for at least three months, and who show signs of marked contraction on the affected side, are given breathing and other exercises to correct the development of any deformity. This treatment should only be commenced when one is fully satisfied that there is no parenchymatous infiltration and that all activity has completely subsided.

When there is a minimal lung lesion present in the lung on the side of the effusion and there is little evidence of dense basal adhesions, a phrenic crush is advised to reduce tension and to give increased rest to the lung. If the lung lesion is more than minimal or is found to be progressive, every effort is made to establish a pneumothorax whilst the patient awaits transfer to a sanatorium, but not infrequently adhesions are present and this treatment fails. The nature of the lung lesion is then of paramount importance and will determine whether further measures to collapse the lung are necessary. In these cases resort to penetrating X-rays and tomography is usually helpful in determining the extent and character of the lesion. Where there are dense adhesions or a large effusion, penetrating X-ray films should be taken in such cases in order to reveal changes in the lung tissues.

Special treatment such as injections of gold salts, promanide and tuberculin have been tried in selected cases, but the results are not encouraging enough to apply such methods as a general rule and cannot be considered at present anything more than experimental.

Complications

Extra-pulmonary complications have been rare, and those that have occurred have not presented any unusual features. It is, however, surprising how frequently secondary lesions have occurred either as foci in the lungs or as an effusion on the opposite side. Not infrequently these lesions have arisen whilst the patient has been confined to bed, and their development has been recorded by serial radiographs. Occasionally a prodromal rise in the pulse rate or sedimentation rate heralded this extension of the disease, but more frequently the onset occurred without any abnormal signs or symptoms. In a number of cases the onset of a contralateral effusion was quite painless and was only discovered by radiography. The shadows in the lung tissue which usually occurred without producing symptoms were in the nature of small Assman's foci, and often disappeared in four to six weeks, but reappeared in another lobe some weeks later. When these small round infiltrations were observed, the patient was treated with great care and rest in bed prescribed until all signs of activity had disappeared.

XUM

Rehabilitation

Some reference has been made to the "hardening off" process which is necessary after strictly medical treatment has been completed, but that process does not cover the full rehabilitation of these cases. It must be remembered that many breakdowns in health which eventually result in pleurisy or minimal lesions of pulmonary tuberculosis are in part or mainly due to continuous overstrain under unsuitable living and working conditions. Many of our cases had been working more than fifty hours per week. In some instances adolescents had been working over sixty hours per week. Successful rehabilitation involves the gradual return to full working capacity and employment at suitable occupations for a reasonable number of hours per week, along with good conditions for living and recreation. The presence of an active tuberculous lesion, however slight, must be taken seriously, for the healing thereof is slow and involves much patience.

If environment has contributed to its development, then the patient should avoid the harmful factors of that environment when he has recovered. To help him to do this the treatment unit should be associated closely with centres where sheltered industrial conditions can be maintained until complete arrest of the lesion has been assured. At present the village settlements are the only places where this can be obtained, but the difficulties associated with the admission of pleurisy patients to these units have been mentioned.

Fortunately, the introduction of measures under memorandum 266 T can be of great help in this direction, provided the physician is willing to notify the individual as tuberculous. It would seem that the advantages of this move considerably outweigh the disadvantages particularly with regard to financial assistance, extra nourishment, after-care and the following up of cases at chest clinics. Part-time and modified employment can be prescribed for a sufficient length of time to overcome that precarious period following discharge from institutional routine and supervision. It will, however, be necessary to obtain the co-operation of both the patient and his employers, who must come to realise that such measures are to their mutual advantage. By these means the patient can eventually be directed back to full employment at work which would, if undertaken immediately on completion of treatment, almost certainly result in a serious relapse. The experiment at Sidcup is showing the necessity for the careful treatment and rehabilitation of all cases of pleurisy, with or without effusion, and of persons with minimal lung lesions. There is still much to be discovered both in the institutional and domiciliary care of these persons, and it is hoped that the unit will be the first of many which will be established in other parts of the country.

XUM

THE CLINICAL ASPECTS OF PULMONARY TUBERCULOSIS IN A COMMUNITY OF AMENTS

By JAMES F. MACMAHON,
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FINDING a high incidence of pulmonary tuberculosis among the inmates of certain mental hospitals, Mott, in 1909, made special enquiry as to the phthisis death rate among aments at Leavesden. He ascertained that of 693 deaths which occurred at the hospital in the 1903-7 quinquennium 208 were caused by phthisis, and his ultimate conclusion was that the high incidence of pulmonary tuberculosis at Leavesden was attributable to the type of patient under care and not to any other factor peculiar to the hospital itself.

In order to view the present situation in proper perspective it is necessary to bring these statistics up to date. During the years 1908-14 the total and tuberculosis mortality rates were respectively 7·9 and 1·97 per cent. per annum. A marked war-time increase in both the general and specific rates was followed by a decline to 0·13 per cent. in 1930 for the phthisis death rate. During the present war history has repeated itself in a modified form, for there has been a considerable deterioration from the 1930 standard.

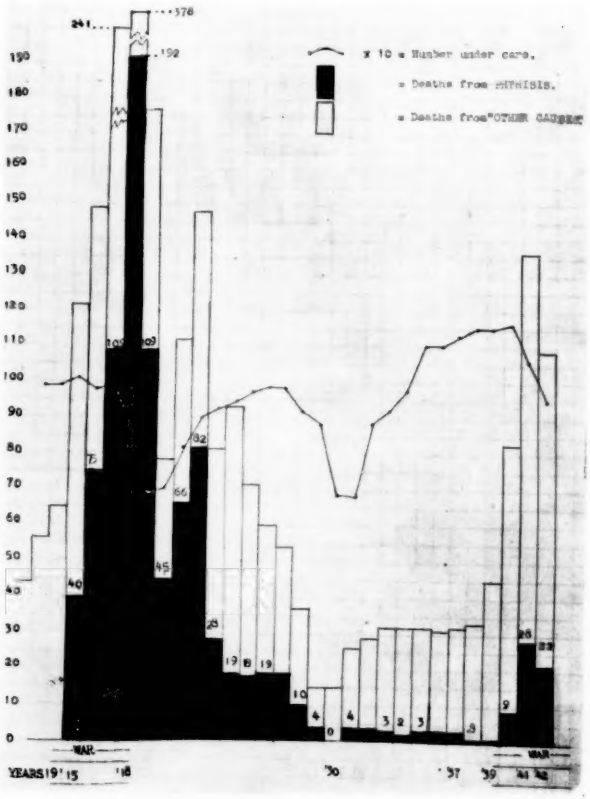
As the annual death rate, general and specific, offers marked contrasts in such different circumstances as sex, peace and war, a graphical exposition of the facts is desirable. This is shown in Graphs I and II, which cover the years 1915-42; the total and phthisis death rates are set out in terms of the number of deaths in each of the categories mentioned per thousand inmates per annum. The sexes are dealt with in separate graphs (Graph I, Males; Graph II, Females), and the number of inmates of each sex on January 1 of each of the years reviewed is indicated by a linear curve. It is important to note that there have been about 1,750 aments under care throughout the period under review, but that since 1934 the total population has been increased by the acceptance of elderly psychotics.

The Medical Research Council (War-time Tuberculosis Committee) (1942) reports that the tuberculosis death rate for aments in representative institutions increased by 170 per cent. for males and 101 per cent. for females in 1941 as compared with 1937-39. Moreover, Daley and Benjamin (1942) state that the increased incidence of pulmonary tuberculosis in mental hospitals of the London area has had disproportionately severe repercussions on the London death rate as a whole.

The figures in Table I show that the 1941 tuberculosis mortality rate at Leavesden was fifteen times that for 1930, and reference to graphs 1 and 2 indicates that the 1941 rate for males was actually five times the sum of the rates for 1937-39. The corresponding percentages for females, however, appear to suggest the paradox that war has actually improved their lot.

PLATE III

Deaths per 1,000 inmates per annum (× 10 = number of inmates January 1 each year).

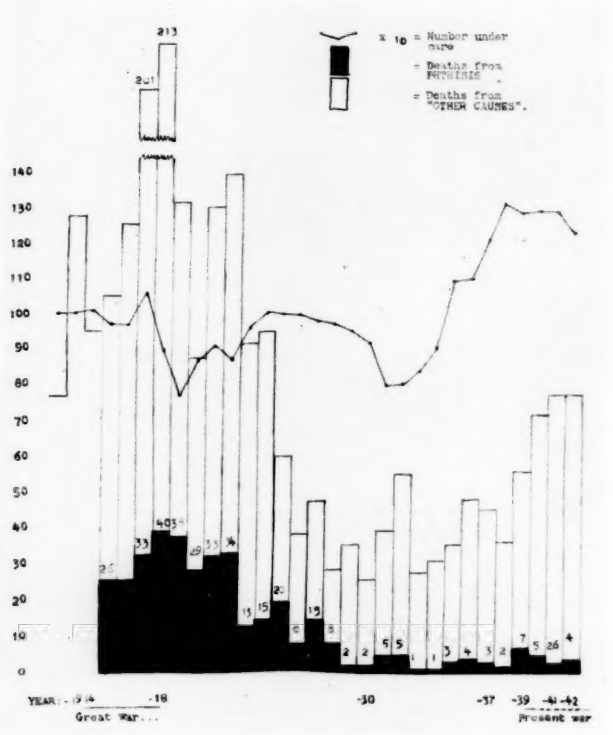


GRAPH I.—DEATHS DUE TO PULMONARY TUBERCULOSIS AND "OTHER CAUSES" AMONG MALE INMATES OF LEAVESDEN HOSPITAL DURING THE YEARS 1915-42.

To face page 14

XUM

PLATE IV



GRAPH II.—DEATHS DUE TO PULMONARY TUBERCULOSIS AND "OTHER CAUSES" AMONG FEMALE INMATES OF LEAVESDEN HOSPITAL DURING THE YEARS 1915-42.

[*To face page* 15.

TABLE I.

	No. of inmates January 1.		Percentage of inmates that died of: Phthisis.		Other Causes.		Total Deaths.	
	M.	F.	M.	F.	M.	F.	M.	F.
1918	958	1,017	19·2	4·0	18·6	17·3	37·8	21·3
1930	694	822	0·0	0·2	1·5	2·4	1·5	2·6
1941	1,154	1,396	2·8	0·3	10·8	7·6	13·6	17·9

During the autumn and winter of 1942-43, 2,235 inmates submitted to a miniature X-ray test for pulmonary tuberculosis. Large (15 ins. by 12 in.) films were used both when scrutiny of the miniature photographs suggested abnormality and when the miniature technique was deemed unlikely to be adequate.

A report on the technique and results of this radiographical survey has already been made by Heaf, Snell and MacMahon (1943). The material results were that 119 patients were referred for clinical investigation because of suspicious X-ray appearances. Thirty-seven of these cases were notified and under treatment before the X-ray survey began, but the remainder were then brought to light for the first time. Attention was concentrated on both these suspects and eleven other cases, notified before the survey began, but reported radiologically as negative or healed. The methods employed are described under the following headings: (1) Symptomatology, (2) Hæmatology, (3) Tuberculin Tests, (4) Bacteriology and (5) Pathology.

(1) SYMPTOMATOLOGY: *Subjective Symptoms.*—The value of subjective symptoms as diagnostic aids varies with the nature and degree of oligophrenia present—most aments, referred as suspects, gave no useful information at all, but individual case histories compensated for this failure to some extent. Sensation, however, appears to be depressed in low-grade aments and they fail to appreciate, with normal acuity, the discomforts attendant on disease. Very occasionally high-grade cases, notably hysterics and epileptics, exaggerate their symptoms or present spurious phenomena, but as a rule both motivation and mechanism are so obvious that such attempts to mislead are futile.

Physical Examination.—In some cases, in which skiagraphy indicated marked disease, little or no auscultatory confirmation was forthcoming; signs of cavitation were rarely demonstrable and, as a rule, adventitiæ were not conspicuous. Indeed, respiratory activity was sometimes so depressed that it was difficult to detect breath sounds at all—still less abnormal phenomena. This observation is in accordance with Mott's (1909) findings in respect of certain types of acute psychotics. Unco-operative behaviour and gross deformities also militated against accurate clinical assessment. In these circumstances inspection, palpation and percussion assume greater relative diagnostic importance than is usually the case and greater reliance must be placed on radiography, laboratory aids and the clinician's intuition and specialized experience than is customary in ordinary medical practice.

(*a*) *Hæmoptysis.*—Hæmoptysis has been noted in less than 10 per cent. of the notified cases during the past few years. When it occurred it usually did so late

XUM

in the course of the disease and was slight in amount; no doubt it sometimes escaped notice, but, as gross hæmorrhage is a rarity and could scarcely be concealed, it is improbable that the actual incidence of hæmoptysis has been much greater than that recorded. The incidence of hæmoptysis in suspects referred on radiological grounds has been, so far, nil.

(*b*) *Cough.*—Among the cases referred as radiologically suspicious of pulmonary tuberculosis cough was infrequently recorded. When observed among them at all it was much more common among psychotics than aments, and among high-grade aments than low. In most aments it seemed to be non-productive. When sputum was produced or seemed to be produced, it was almost invariably swallowed, and this, of course, precluded the possibility of taking direct smears. The thesis that cough is usually non-productive in these cases is supported by the low incidence of clinically manifest laryngeal and alimentary tuberculosis, cavitation of the lungs and war-time autopsy findings. Moreover, when aments suffer from tracheitis, bronchitis and pneumonia cough is not a prominent symptom. Indeed it seems possible that there is an actual depression of the reflex in low-grade aments, and the rarity with which coughing is heard in the wards is often the subject of comment by medical officers who have had recent experience of other forms of medical practice.

(*c*) *Sweating.*—Axillary hyperidrosis and night sweats are not common among tubercular aments. Some, particularly the helpless and crippled, seem to sweat unduly, but this phenomenon is not necessarily evidence of toxæmia but may be caused by disturbances of the sweat mechanism and inefficient skin ventilation.

(*d*) *Febrile Response.*—There is sometimes difficulty in evaluating the febrile responses of low-grade aments correctly. Such cases tend to resemble children in the lability of their body heat mechanism, but they do not so readily and consistently have high temperatures. Among the referred cases the classical diurnal swing was not often observed, but intermittent rises of temperature occurred. In exercise tolerance tests such as a mile walk, both controls (radiographically negative and clinically normal) and suspects sometimes reacted by excessive rises of temperature. It seems probable that because many aments lead vegetative lives, imperceptibly affected by emotion and metabolic stimulation, their respiratory movements are minimal. This presumably limits the circulation of toxins from foci in the lungs or elsewhere, and thus the clinical signs of toxæmia tend to be slight, unless radical variations in their environmental conditions are made.

(*e*) *Weight Variations.*—This community, in common probably with many others, has sustained a war-time decline in body weight. Suspects, however, differed little from general ward populations in this respect. Indeed, of seven new cases disclosed in this survey and confirmed bacteriologically, three have gained an average of a stone weight each during the past few years on ordinary diet.

(2) Hæmatological Factors.—Blood sedimentation rates of both suspects and notified cases averaged high levels, being fast in 40 of 61 female, and 27 of 41 male cases referred. Of 39 highly suspicious radiographical suspects only 5 cases were normal. These results are interesting in the light of those obtained

by Berrington and Greenwood (1942) at West Park Hospital, where preliminary sedimentation-rate tests were used as criteria for the selection of cases for X-ray examination (for the existence of active pulmonary tuberculosis).

No doubt the E.S.R. is high in the vast majority of active cases, but as quiescent and arrested cases are not necessarily indicated by this test, and as many cases pursue a sub-clinical course in mental deficiency practice, some temporarily quiescent cases might be missed unless the test were very frequently and regularly applied. Moreover, it has been suggested that hyper- and hypo-kinetic patients may exhibit anomalies of the E.S.R. quite independent of the existence of somatic disease. As at West Park, the Westergren technique was adopted, but the methods of graphical calculation described by Day (1943) and Della Vida (1942) were employed. Corpuscular volumetric tests and corrections for anæmia were not made.

Monocyte : Lymphocyte Ratios.—Dr. H. Angell Lane estimated these ratios in the blood of 136 patients, including notified cases. For the purpose of the test the ratio of 1 monocyte to 2·7 lymphocytes was taken as the limit of normality. 37 of 51 notified cases and 25 of 38 radiographical suspects gave unduly high relative monocyte counts. These results served as pointers when X-ray evidence was strongly suggestive of tuberculosis, but clinical findings were equivocal and bacteriological tests negative.

(3) TUBERCULIN TESTS: (*a*) *The "Patch" Test.*—Some patients failed to keep the plasters *in situ* and others exhibited unexpectedly high febrile reactions. As, however, only a single batch of the plasters was used comment on the value of the test seems unwarranted.

(*b*) *The Mantoux Test.*—With only one exception all the radiologically strongly suspect cases were positive to 1/1,000 tuberculin. Erythema of an area of 5 mm. diameter was taken as the minimal positive reaction. In many cases there was also a brisk febrile response to this test.

(4) BACTERIOLOGY.—As those cases notified and under treatment before this survey began had already been confirmed bacteriologically, further tests were restricted to suspects brought to light by radiographical investigation. In the absence of specimens of sputum, and in view of the unco-operative attitude of patients, both the direct smear and laryngeal mirror methods were obviously impracticable. Dr. Cruickshank, of the North-Western Group Laboratory (L.C.C.), however, advised the inoculation of acid-concentrated samples of stomach washings and fæces on single slopes of Jensen-Lowenstein medium. The North-Western and the Central Pathological Laboratories (L.C.C.) co-operated with the Leavesden Laboratory in carrying out these tests. So far the stomach washings of 108 and the fæces of 94 cases have been cultured. Moreover, 24 cases had stomach washings and fæces inoculated in guinea-pigs. The fæcal injections were of course purely experimental. (Eleven guinea-pigs died within four days of inoculation from Clostridium Welchii infection.)

The following table gives the results obtained by the various tests in the positive cases:

XUM

TABLE II.

Case.	Culture of :		Guinea Pig Inoculations with :	
	Stomach Washings.	Fæces.	Stomach Washings.	Fæces.
A ..	†	C	†	†
B ..	†	O	O	O
C ..	*	†	—	—
D ..	†	†	—	—
E ..	O	O	O**	†
F ..	†	†	—	—
G ..	†	—	—	—

NOTE.—" C " equals contaminated.
" * " equals patient refused to tolerate stomach tube.
" ** " equals guinea-pig died four days after inoculation.
" † " equals positive culture.

(5) PATHOLOGY.—Since this survey began sixteen cases of pulmonary tuberculosis have come to autopsy. In these, and indeed in the majority of war-time tuberculosis deaths, the disease assumed the form of acute pneumonic phthisis. In a small proportion of those cases which were the subjects of post-mortem, tubercular lesions of the intestine and, more rarely, of other viscera, were found. The almost universal absence of macroscopic evidence of resistance to the terminal acute infection was striking, but scarred apices, scattered calcifications and thickened pleura indicated that resistance had, at one time, been effective; gross fibrosis and old cavities were, however, not in evidence. Indeed, the composite post-mortem picture suggests that the majority of subjects, whose defences against the bacillus had been adequate in the past—perhaps the remote past—succumbed to the same infection, in a highly acute form, without apparently offering effective resistance at all. It is also notable that most of these cases were males, that they died at times when, or after, acute respiratory infections were rife, and that although in many the nature of the disease was suspected (in its later stages), bacteriological confirmation, if found at all, was only forthcoming when the patients were moribund. Terminal acute pneumonic phthisis has been found at autopsy in 81 per cent. of 42 war-time deaths from pulmonary tuberculosis, whereas it was noted in 6 of 11 tuberculosis post-mortems in the period 1937-39. The ratio of primary to secondary infections has not been indicated as available data are inadequate.

The incidence of active tuberculosis among inmates (in terms of mental classification) has been set out as a matter of interest, but the total numbers involved do not justify generalisations. The idiot group includes a high proportion of crippled and deformed patients, completely dependent on unremitting care and attention for their very survival. Under local conditions, however, they have more fresh air and sunshine than many other inmates. Imbeciles are, on the whole, more active physically than idiots, but this very fact, associated with their innate stupidity and degradation, increases both their risk of contracting infection and the difficulty of protecting them against it. The feeble-minded approach normal standards physically and mentally, but

TABLE III.—ANALYSIS OF RESULTS IN RESPECT OF INMATES LIVING ON JANUARY 1, 1943.

Number of Inmates:	*Male.* 972	*Female.* 1,267	*Total.* 2,239
†*Cases deemed active on January* 1, 1943:			
Notified and confirmed bacteriologically before this survey began	7: 0·7%	5: 0·4%	12: 0·5%
New cases disclosed by this survey and confirmed bacteriologically	5: 0·5%	2: 0·2%	7: 0·3%
New cases detected on autopsy held after 1/1/43	4: 0·4%	2: 0·2%	6: 0·3%
*New cases disclosed by X-ray and confirmed clinically, but not, so far, bacteriologically	14: 1·4%	15: 1·2%	29: 1·3%
†Total active cases	30: 3·0%	24: 1·9%	54: 2·3%
Cases deemed arrested‡ on January 1, 1943	9: 0·9%	17: 1·3%	26: 1·2%
Grand total	39: 4·0%	41: 3·2%	80: 3·5%

* In the light of clinical, radiographical and hæmatological findings and war-time post-mortem experience it has been thought advisable to grade these doubtfully quiescent cases as active despite the absence of bacteriological confirmation.

† Cases transferred to Leavesden specifically for treatment of pulmonary tuberculosis contracted elsewhere have been excluded.

‡ An arrested case is one which has been quiescent between 2 and 5 years.

INCIDENCE OF ACTIVE PULMONARY TUBERCULOSIS IN TERMS OF MENTAL CLASSIFICATION.

Grade.	*Number of Inmates.*		*Active Cases.*		*Totals.*	
	M.	*F.*	*M.*	*F.*	*Cases.*	*Per cent.*
Idiots	61	101	4: 6·5%	1: 1·0%	5	3·0%
Imbeciles ..	470	437	16: 3·4%	10: 2·3%	26	2·8%
Feeble-minded ..	294	397	4: 1·7%	6: 1·4%	10	1·4%
Psychotics ..	152	323	6: 3·9%	7: 2·2%	13	2·8%
Total	977	1,258	30: 3·0%	24: 1·9%	54	2·3%

AGE INCIDENCE OF PHTHISIS.

	Æt. 16/19		20/29		30/39		40/49		50/59		60/69		70/+	
Active ..	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*
Arrested ..	2	0	3	0	9	5	5	7	7	5	1	3	3	4
	1	0	0	1	2	3	4	3	1	2	0	5	1	3
Total ..	3	0	3	1	11	8	9	10	8	7	1	8	4	7:–80

Note.—Cases under sixteen years of age not accepted for admission.

XUM

psychotics have many points in common with imbeciles. Male dements are perhaps more degraded than females, but respiratory disease is quite common among both sexes.

The incidence of pulmonary tuberculosis in relation to the chronological age of the patients seems to indicate that, compared with the general population, the disease occurs later in life. Exactly 50 per cent. of the active cases occurred in the 30-49 years age group and 38 per cent. among inmates more than fifty years old. It should, however, be noted that patients under sixteen years of age are not accepted at Leavesden and that the admission of elderly psychotics increases the number of elderly inmates disproportionately.

Discussion

During the pre-war decade the female tuberculosis death rate at Leavesden exceeded the male, but since the outbreak of war the contrary has been the case. In light of the M.R.C. Tuberculosis Committee's report (1942), to which allusion has already been made in this paper, this change cannot be dismissed as merely a local phenomenon. Inherently defective viability might be a contributory cause of the increased tuberculosis mortality, but the swing of the pendulum to the detriment of males is not explained by such a theory. War-time stresses in the home may have been responsible for the admission to hospital of the more troublesome and dependent types of aments in increased numbers and thereby exposed them to the adverse as well as beneficial influences of institutional life, but, even then, the apparently more lethal effect of the bacillus on males than females is not explained.

Without attempting the task described by Haldane (1941) of disentangling the parts played by nature and nurture in tuberculosis, it may be asserted that the more favourable the environment, the greater the survival prospect of such patients. Tredgold (1937), like Mott (1909), stresses the importance of susceptibility, but he also emphasises the need for improving the conditions under which the ament lives. He illustrates and points his argument by citing the reduction in tuberculosis mortality achieved at the Royal Eastern Counties Institution, where rigorous attention to ventilation and general hygiene led to the reduction of the pulmonary tuberculosis death rate from 4·6 per cent. to 0·18 per cent. per annum in 1935. Incidentally, the 1930 rate at Leavesden (0·13 per cent.) also shows that, under favourable environmental conditions, genetic disabilities may be overcome.

It is also significant that the decline in the Leavesden general and specific mortality rates during the years 1922-30 was shared by both sexes and coincided with a general improvement in their environment. Reference to war-time conditions is therefore relevant and factors peculiar to either sex merit particular attention.

(1) Ventilation and Sunlight.—The black-out, blast walls and overcrowding have had no doubt adverse effects, but although they render ventilation less efficient their application is uniform throughout the hospital. The orientation of the wards, however, is on the whole to the advantage of female patients, whose wards have more sunlight and are less exposed to north-easterly winds.

(2) Dietetic Alterations.—Restrictions were, for patients, more severe during the last war. So far, during the present conflict, male inmates have, on the average, lost 8 per cent. and females 12 per cent. of their body weight. Hence, unless an unknown metabolic factor is involved, nutritional failure is not the solution of the problem of the disproportionately high male mortality rate from pulmonary tuberculosis, although, no doubt, any impairment of nutrition may contribute to diminished resistance to infection.

(3) "Other Respiratory Disorders."—Table IV indicates the ratio of deaths from phthisis to deaths from "other respiratory disorders" and "other causes" during three war-time and three peace-time years.

Table IV.

	Deaths attributable to :							
	Phthisis.		*Other Respiratory Disorders.*		*Other Causes.*		*Totals.*	
	M.	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*
1937-39	5	17	28	40	95	143	128	200
1940-42	68	17	160	88	144	217	372	322

N.B.—19 per cent. of all male and 31 per cent. of all female war-time deaths were the subjects of autopsy; 18 per cent. of all male and 61 per cent. of all female war-time deaths from phthisis were also so confirmed.

It is clear that the number of male war-time deaths from "other respiratory disorders" outstripped the corresponding female mortality rate increase many times. Moreover (see graphs 1 and 2), in 1941 the ratio of male to female deaths from phthisis was in the ratio of about 15 to 1, whereas the present incidence of active pulmonary tuberculosis has been calculated to be in the ratio of 3 to 1·9. Indeed, if arrested and active cases are taken together, the discrepancy in the sex incidence rates is further reduced (4 to 3·2).

In light of these statistics and radiographical, clinical and post-mortem findings during this survey it seems as if intercurrent respiratory infection contributed very largely to the higher male death rate from pulmonary tuberculosis, perhaps by reactivating dormant lesions which were, if the present situation is an index, only slightly more common among them.

(4) Exposure to Infection.—Sir William Osler (1901), quoting Cornet, remarked that the consumptive is almost harmless and only becomes harmful through bad habits. Osler went on to say that in those who are dirty or careless the material that they handle readily becomes infective. These remarks, which now perhaps seem trite, are of good pedigree and distinctly relevant to the problem of exogenous infection at Leavesden. With a degraded population living under overcrowded conditions it would seem inevitable that infection spread like wild-fire. Indeed, respiratory and intestinal infections sometimes seem to do so, and, judging by incidence and mortality figures, it would seem that pulmonary tuberculosis is no exception. Bacteriological tests of apparently active cases have, however, been rewarded with an astonishingly low proportion of positive results, and the only plausible solution of the

XUM

paradox would appear to be that the "activity" of most of the cases at present under care is very low grade in character, that their infection is rarely "open," and that the risks of their spreading infection, despite their degradation, are slight. If such doubtfully quiescent cases were, however, to fall victims to acute intercurrent respiratory infection such as was rampant in 1941 at Leavesden, then it is possible that their tubercular foci might flare up with a resultant exogenous dissemination of infection. Such in fact is the writer's opinion of the actual sequence of events in war-time pulmonary tuberculosis at this hospital. A further point relevant to the question of the spread of infection is the low recorded incidence of such affections as alimentary and laryngeal tuberculosis and negligible frequency with which tubercular dermatoses are encountered among such patients.

If the hypotheses advanced are correct it is probable that many of those who have survived exposure to tuberculosis in the past few years have now either become sensitised to the disease or have acquired heightened resistance to it. Unfortunately data regarding sensitivity are not available, but a "Mantoux survey" now being carried out may prove to be of considerable value when new cases come to light.

(5) NURSING.—

TABLE V.

	Ward Nursing Staff:						*Total.*	
	Trained.		*Partly Trained.*		*Untrained.*			
	M.	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*
1938	170	101	30	39	14	83	214	223
1943	86	78	0	12	31	51	117	141
War-time reductions ..	50%	23%	—	30%	—	61%	45%	37%

NOTE.—Patients are nursed exclusively by members of their own sex. "Trained" nurse equals holder of final R.M.P.A. certificate or equivalent.

The ratio of trained to partly trained and untrained male nurses is normally very high and has now been halved. It has been difficult to find efficient substitutes for men called to the colours, and as a rule their replacements have been elderly, inexperienced men unfitted for military service. The corresponding proportion of trained female nurses has always been lower, but the quality of female recruits has certainly deteriorated.

The nursing of low-grade aments, particularly the infirm and degraded, demands of nurses qualities of patience, tolerance, sympathy and phlegm, probably present in lesser measure in men than women, who tend to sublimate their maternal instincts in devotion to their patients. Female nurses have not, of course, a monopoly of these qualities, but their male counterparts seem to need more training and practice before they can compete on equal terms. The peace-time success of male nurses is probably implicit in the fact that, once enrolled, they tend to make nursing a career, whereas, for a variety of reasons, women do not so often do so. Two other factors have also operated to the disadvantage of male patients: (1) Civil defence duties, which have still further

reduced the effective number of male nurses in the wards; and (2) the reduction of the medical staff from eight to five physicians with an inevitable diminution, rather than necessary increase, in the supervision required to offset the effect of the shortage of nurses.

During the war of 1914-18 the male nursing situation was even more acute than at present, and both aments under care and workhouse inmates were called upon in an attempt to cope with the staff shortage problem.

In view of the insight and skill required for the efficient nursing and care of oligophrenics and the difficulty of detecting the early—and sometimes late—symptomatology of disease in such cases, it is difficult, in the light of experience in war and peace, to deny the significance of the war-time staff position in relation to the increased incidence of respiratory infections in general and the high male phthisis death rate in particular.

The Present Position and Measures taken to Control it

It seems a tenable hypothesis that the vegetative habitus, depressed respiratory function and blunted sensibilities of the majority of tubercular cases under care contribute to the relative quiescence of their lesions and sub-clinical symptomatology. Indeed, for anergic cases the induction of artificial pneumothorax would seem a superfluous procedure, and segregation combined with attention to general health, nutrition and hygiene appear to constitute adequate therapy.

The administrative measures taken include the following: (1) All cases of pulmonary tuberculosis have been classified as "active," "arrested" or "healed," as defined in the Ministry of Health Memorandum 37/T, 1930.

(2) New admissions and all cases presenting suspicious or equivocal symptoms are X-rayed.

(3) Obviously active cases are admitted direct to sanatorium wards, but both suspects and arrested cases are segregated in ordinary wards set apart for that purpose.

This policy of segregation of unconfirmed and arrested cases has been adopted both because of the necessity of using sanatorium beds to the best advantage, and because it has been found that a sanatorium regimen usually improved the condition of doubtful cases to such an extent that accurate assessment became more difficult. In effect these segregation wards reduce the risks of a spread of tuberculosis in addition to permitting a skilled staff to control suspects and arrested cases still living, to all intents and purposes, in their normal environment.

Summary

Over 1,500 deaths from pulmonary tuberculosis have been the subject of analysis and discussion. A miniature radiographical survey of a community of 2,239 aments and dements has been carried out and, after clinical assessment of suspects, 3 per cent. of the male and 1·9 per cent. of the female inmates have been found to be suffering from pulmonary tuberculosis. These results have been analysed in terms of age, sex incidence and mental classification. Environmental factors have been discussed in light of the vastly higher death rate from phthisis in war than peace and in males than females.

XUM

Measures taken to cope with the situation include skiagraphy of all admissions, suspects and equivocal cases, the segregation of suspects and arrested cases and the culture of stomach washings as a means of diagnosis.

Pulmonary tuberculosis constitutes a particularly formidable menace to closed communities composed of biologically inferior and mentally subnormal persons; the danger is increased when war-time circumstances modify their environment and regimen. Under such conditions there may be an incidence of the disease so high that it may assume the proportions of a "local epidemic."

There are grounds for the opinion that the mobilisation for active service of half the trained male nursing staff may have been a contributory factor of major importance to the higher mortality rate of male as compared with female inmates.

I wish to express my thanks to Dr. R. M. Stewart, Medical Superintendent of Leavesden Hospital, for persuading me to write this paper; to Drs. F. R. G. Heaf, W. E. Snell, R. Cruickshank and H. Angell Lane for the various data and results I have used; and to the staff of this hospital without whose co-operation this investigation would not have been possible.

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THE LIFE AND DISCOVERIES OF RENÉ LAENNEC*

By CLIFFORD HOYLE

The century which saw the childhood of Laennec in its closing years had been disastrous for his country. There were incessant ruinous wars and restless signs of approaching turmoil. Both the arts of peace and the craft of government steadily decayed. France's interests in India and Canada were largely lost, and her own people brought near to beggary. There was no political freedom, no fair taxation, no efficient executive and no shadow, let alone the substance, of social equity. So the seeds of revolution were sown; and nourished by such events, those seeds grew fast in a country that was still essentially a feudal state. Thus Laennec spent his boyhood at a time of violent change, his manhood during the Napoleonic era, and his last years in the aftermath of frustration and disillusion. We need to take into account this

* A lecture given at Horton Hospital, Epsom, December 1943.

historical setting of his life before we can rightly judge the man. For it was not an age conducive to calm and protracted thought and observation, or to the pursuit of knowledge for its own sake. Yet these are the very qualities in which Laennec excelled.

René Théophile Hyacinthe Laennec was born on the 17th February 1781, the year which saw Johnson's *Lives of the Poets*, and the second and third volumes of Gibbon's *Decline and Fall*. Wordsworth was a lad of eleven. Napoleon, a little older, was already two years on with his military education at Brienne. John Hunter was in his prime at fifty-three. Seven years before Priestley announced the discovery of oxygen. Albrecht von Haller, the " prince of physiologists," died four years ago. Morgagni had already been dead ten years. But the most important date near by was that, nineteen years earlier, on which Rousseau's *Contrat Social* appeared; and his opening words, " Man is born free and is everywhere in chains," had not been lost upon his generation. Adam Smith had taught something of the wealth of nations; Voltaire had outraged established orders and amused the others; and Burke was still in his grandest vein. No one had any reason to suppose that the infant son of a Breton country lawyer was destined to reach an equally enduring fame. Certainly the good people of Quimper, the little port about thirty miles from Brest, could not have guessed. For the Laennecs, though respectable Celts and reputable lawyers, had never achieved anything but a local name; and, in point of fact, René's father was a rather shiftless improvident character who neglected his family and lived on his sons later in life.

His neglect was a fortunate thing for the boys in one respect. For when their mother died in a fourth confinement, René and his brother were sent eventually to an uncle at Nantes, Guillaume François Laennec. There they entered a home of common sense and good judgment. Guillaume was Rector of the University, a man of high intelligence, a scholar and a doctor, a good speaker and writer, with a precise and critical mind. And he also had a flair for encouraging the best in others. Here René remained for thirteen years under his kindly, humorous and paternal eye, as a schoolboy to begin with, and later as a medical student, until he left for Paris at the age of twenty. This period saw the growth of his character and mind; and we cannot doubt that his uncle's influence was very great during these formative years. To Guillaume Laennec, therefore, we owe a debt we can never pay; for had René been left to his father instead, maturity would certainly have seen a different person.

At the time Laennec arrived, Paris was the seat of a great new school of morbid anatomists—Bichat, Corvisart, Dupuytren and Bayle. Necropsies on hospital patients were invariable: for twelve years no patient died in the Charité without examination. Jean Nicholas Corvisart led the staff. He was a lawyer's clerk who ran away from home, a great character, the first cardiologist, and a fine teacher—who wrote his thesis on " The Pleasures of the Study of Medicine and the Disagreeableness of its Practice," who refused a hospital appointment because it meant appearing in powder and wig, and who became Napoleon's personal physician and seems to have been one of the few who could manage him. There, from 1801, we find Laennec absorbing his teaching and soon joining Bayle and Dupuytren in their researches. The three became firm friends at the time, planning a book on morbid anatomy. Though the

XUM

project fell through, much of the work was reported in various places. Laennec's first paper came within a year, a report of a patient with an ossified mitral valve. Two months later he did an account of six cases of peritonitis, in which he set forth the clinical forms and facies for the first time. This was his first step on the ascent of fame. Next year he described the subdeltoid bursa, and a year later showed that hydatid cysts were due to a parasite, and did not grow, as had been thought, from the tissue in which they appeared. Also he described the capsules of the liver, spleen and kidneys, and gave the first considerable account of portal cirrhosis. Then, for a change, he wrote on ascaris lumbricoides. That same year he did his thesis and received his diploma. After that came a fine paper on melanosis. By now he was teaching morbid anatomy and starting to build that reputation which drew all and sundry to his lectures later on. But for some time to come he published nothing new: teaching, hospital work, an editorial appointment and an increasing practice consumed his time.

Laennec's interest in morbid anatomy went far beyond its teaching. For he saw that the new science of descriptive pathology allowed correlation between diseased states and their clinical features during life for the first time. Thus Laennec took morbid anatomy into the wards—and what happened there to the necropsy. This approach was new: nothing like it had been done in earlier times. It is true that he was not its first or only exponent: Morgagni had started and Corvisart continued much the same thing. But within the field of discovery presented, Laennec made greater and more fundamental contributions than any of his fellows.

These depended to a large extent upon a single discovery. Searching for the links between the living and the dead, he began to wonder whether anything might be learnt by studying the sounds made in the lungs and heart in health and disease. To do this properly he needed an instrument with which to intensify the individual sound. That instrument was the stethoscope. Its early discoveries in his hands he gave to the Academy of Sciences in Paris on February 28, 1818. Within a month he also announced the discovery of ægophony and pectoriloquy; and in August of the following year published his collected observations in two volumes entitled, "A Treatise on Mediate Auscultation in the Diagnosis of Diseases of the Lungs and Heart, based Principally upon a New Method of Examination." The two volumes cost thirteen francs, a stethoscope two and a half.

Laennec was thirty-seven when he wrote his book, a thin meditative man of about five feet three, with chiselled features, high cheek bones, a long head, light brown hair and blue-grey eyes. He was neither handsome nor robust. Also one imagines he was rather shy and aloof, a little austere, lacking a keen sense of humour, and thus not one of those to whom success comes easily. Neglect at home as a child and dependence on his uncle, acting on a temperament naturally reserved, must have made him chary of the world at large. But his power of application and sincerity were immense, and seem to have left few who came into contact with him in any doubt about his greatness. There was nothing flamboyant, nothing ostentatious, about Laennec. Throughout life he remained simple in his tastes, content with very little in the way of personal comforts and amusements, and wrapped in his work. In

XUM

what time he spared he learnt to play the flute very well, danced a bit, read widely in the classics and rambled in the countryside near Paris or by the shores of his native Brittany. He was hardly versatile as some great men have been. His memorable work dealt with one branch of medicine only. Nor was he particularly learned in an academic sense. He was, essentially, a pioneer; and like many pioneers, he had penetration rather than range, depth rather than breadth, an immense grasp of detail rather than that kind of ability which roves more superficially through large tracts of knowledge. We know that he was well aware of his own ignorance on many things, and readily confessed it. But on the subject of his own choice he made the knowledge of others seem like the simplicity of the child or the savage. For in a few brief crowded years he fashioned the science of diagnosis of diseases of the chest so completely that, as Lawrason Brown truly said, " he who now adds a single stone to the structure is deservedly acclaimed by his fellows."

How should we fare today if we were barred from easy information of heart sounds and murmurs, of pericardial friction, of bronchial breathing and whispering pectoriloquy, of absent breath sounds over fluid and pneumothorax, and of the innumerable adventitious sounds within the lungs? Perhaps some of us do manage without these things; if so, we owe nothing to Laennec in our training on physical signs. But if we pretend to know anything about diseases of the chest we are automatically in his debt. For there is hardly a topic which he did not touch, hardly a disease which he did not describe or redescribe, hardly a clinical picture which he did not either sketch or paint in that particular branch of medicine. Today we have three brilliant additions to the methods of diagnosis current after his day: radiography, bronchoscopy and exploration of the chest. If we are ever inclined to compare, or to set one or other of these against the methods practised by Laennec, we need to remember that when the newer method is superior, it is not always as practicable, as reliable, or as safe. Every method has flaws and fallacies. Errors of interpretation are not confined to stethoscopic signs. It takes at least as long to read radiographs correctly as it does to learn how to use a stethoscope. And there are situations in which the latter is still the only means of diagnosis. Perhaps the fairest thing to say is that all means are complementary and that the passage of more than a hundred years has not seen the value of his work decay. In Laennec's day there was no complement to the stethoscope; it was the only way by which certain evidence could be found. He observed and correlated, and gave, one after another, a whole series of clinical and pathological descriptions either unknown or imperfectly appreciated before his time. And he did it all with a command of words not often found in medical writing.

That his book made a stir is not surprising, for it is one of the greatest works in medical literature, one of the few without which medicine could not have grown to its present stature. It starts with a quiet introduction: " I began, three years since, the researches of which I now publish the results," and goes on to give his reasons for making morbid anatomy the foundation of clinical diagnosis. But it is in the second edition of his work, some years later, that we see the mature Laennec at his best in his opening paragraphs. Here he begins: " Of all diseases which are essentially local, those of the thoracic organs

XUM

are unquestionably the most frequent; while in point of danger, they can only be compared with organic affections of the brain. The heart, lungs and brain constitute, according to the happy expression of Bordeau, the tripod of life: and none of these organs can sustain any considerable or extensive morbid change without the greatest danger." He recalls that diseases of the chest also take first place among those affections which, either as complications or effects, are found to accompany other diseases of a general nature. In maladies of every sort, whatever be their seat, death scarcely ever occurs without the chest becoming affected in one way or another. However frequent or dangerous such diseases may be, they are, nevertheless, more often curable than any other severe internal disorder. These simple sentences, with which Laennec begins the approach to his subject, have something of the grand manner in the ease with which he succeeds in creating atmosphere by the expectation derived in his readers. It is all so far removed from the recitation of observed fact which is the real business of the book. Yet he establishes the importance of his subject and arouses our interest in what he has to say. At a glance we see the design of the book; and before Laennec has reached the end of his first paragraph we have to add the qualities of the artist to whatever others we find him to possess.

Then he begins his theme: that correct diagnosis is so essential, and yet hitherto has been so often baulked. He pays tribute to current methods, giving to Auenbrugger the honour of one of the most valuable discoveries in medicine. But percussion needs amplification. Even direct auscultation, just beginning, has a limited value. " Independently of its deficiencies, there are other objections to its use: it is always inconvenient both to the physician and patient; in the case of females it is not only indelicate, but often impracticable; and in that class of persons found in hospitals it is disgusting." But Laennec's objections to direct auscultation were wider than these; they were scientific. For he goes on to say that "for these various reasons this measure can but rarely be had recourse to, and cannot therefore become practically useful since it is only by numerous observations, and the comparison of numerous facts of the same kind, that we ever, in medicine, separate the truth from the errors which are constantly derived from the inexperience of the observer, from the varying fitness of his perceptive powers, the illusions of his senses, and the inherent difficulties of the method of exploration which he employs." Nowhere is there a more apt or cogent statement of the pitfalls with which an investigator may expect to meet, and of which he must be well aware.

Laennec then tells the experience which set him to defeat the difficulty. In a stout young woman with a diseased heart neither percussion nor palpation gave any help. He tried a roll of paper with which to listen to her heart sounds, and " was not a little surprised and pleased to find that I could thereby perceive the action of the heart in a manner much more clear and distinct than I had ever been able to do by the immediate application of the ear." He began observations at the Necker Hospital, where he had about a hundred beds. The first stethoscope saw the light of day after various trials. It was a wooden cylinder an inch and a half in diameter and a foot long, with a central bore just over two millimetres wide. The cylinder was in two parts screwed together for convenience, and had a hollowed out funnel-shaped

depression at the chest end into which fitted a small brass tube attached to an end-piece. Modifications of this instrument never affected the principle of its construction; a wide concave ear-piece is the sole addition to the monaural stethoscope of today. Laennec made his first wooden stethoscope in 1817, and before his book appeared the instrument was already known in this country. A Dr. Granville brought one from Paris in November 1817, and when he settled in practice in Saville Row began to use it, much to the amusement of his friends. By 1820 the stethoscope was imported for sale. Trentell and Wurtz, a firm of booksellers in Soho Square, brought some over, and when the supply ran short a wood turner named Allnut, living in Piccadilly, started to make them. Medical officers in the British Army were asked to try the new method and to report their results; and the Navy, not to be outdone, did the same.

Reverting to the book, Laennec proceeds to describe examination of the chest. We need select only a few of his observations to show how thoroughly he was the master of physical examination. For instance, he notes that fluctuation in the intercostal spaces can only be seen when fluids have penetrated the intercostal muscles and become extravasated beneath the skin; or, still more rarely, when the intercostal spaces are rendered prominent by pressure of fluid within the chest. He remarks the many occasions on which palpated voice sounds fail to inform, or on which we are not justified in drawing conclusions from their absence. His views on inspection are at first glance faulty, for he deprecates the value of differences in thoracic movement, and even goes so far as to say that he cannot recall a single case in which reduction of movement added anything to the certainty of percussion and mediate auscultation. To us, who think so much of a functionally efficient lung and of breathing exercises, this sounds like heresy. Yet he notices the difference between abdominal and thoracic breathing, and cites in his list of causes of reduced respiratory movements variations due to age, the state of wakefulness or sleep, of motion or repose, of calmness or agitation of mind. He thought that differences on the two sides were constant only with large effusions or deformity. " I have repeatedly assured myself that the dilatation was equable in phthisical subjects, whose lungs were very unequally charged with tubercles " —a remark from which we can scarcely dissent.

Those who parade the uncertainties of percussion as though their own discovery might be referred to Laennec. " It enables us to detect the existence of an obstruction of the lungs or an effusion into the pleura of a moderate extent; but it cannot discriminate these from each other. Many causes, moreover, conspire to circumscribe the number of cases in which it is of use Its indications are very equivocal when the disease occupies the centre or roots of the lungs, or when both lungs are simultaneously affected; they are deceptive when the chest is deformed even in a slight degree, and they are extremely uncertain or cease entirely when the integuments are œdematous or loaded with fat, and yet more, when they have become flabby from the removal of this excessive degree of obesity." These criticisms might well have come from one long trained in radiological methods. He makes no attempt to contrast the fallacies of percussion with the certainties of auscultation as a lesser man would have been tempted to do ; and there is no trace in his comment of anything but fair and disinterested assessment. When we consider also that the method was

new, that Laennec had been trained and still worked in the school led by Corvisart, who enthusiastically sponsored percussion, we begin to see something of the depth of insight and balance of judgment which he enjoyed.

There follows an account of mediate auscultation, describing first the normal breath sounds heard in the lungs, the trachea and the larger bronchi. Puerile, bronchial and cavernous breathing are all clearly separated from each other and from normal vesicular breathing. Pectoriloquy and bronchophony come next; and then ægophony. On this Laennec says: " My uncertainty as to the nature of ægophony was of long duration, because it does not exist in every case of pleurisy; because the analogous phenomenon of bronchophony is still more frequently wanting in peripneumony; because these two diseases and consequently the two phenomena in question are frequently combined; and, finally, because the number of fatal cases of these diseases, and more particularly of acute pleurisy, is too inconsiderable to afford many opportunities of verifying, by examination after death, the accuracy of the diagnosis derived from auscultation." He came to associate ægophony exclusively with pleurisy, where in fact he was in error; but he found it in every one he saw for five years, excepting very slight or far advanced effusions. Very acute effusions show it for a few days only, but chronic effusions may do so for several months, the sign varying then with the quantity of fluid. With very large effusions, particularly those sufficient to distend the chest, it ceases entirely. He never observed it in old cases of empyema with the lungs compressed upon the mediastinum, but found it even when the pleura contained two or three pints of pus, provided that the lungs were prevented from being quite removed from the side by previous adhesions. We must remember that these observations were his own and were new; yet they sound so modern that they might come from any present textbook. Laennec's teaching has indeed become part of the current coin of medicine.

Another instance of the same thing is seen with adventitious sounds, of which he gave a detailed description and classification. He used the term râle for all sounds, apart from those of health, produced in the act of respiration by the passage of air through fluids in the bronchi or lungs or by its transmission through any of the air passages, partially contracted. He separated râles into five different sorts: the moist crepitant râle, or crepitation; the mucous râle, or gurgling; the dry sonorous râle, or snoring; the dry sibilant râle, or whistling, and the dry crepitant râle, or crackling. As on other matters his account was not only accurate but complete. Though the term " rhônchus " has come into general use for Laennec's dry sounds, there has been no real addition to his description. A musician once remarked that when Beethoven had finished with a tune no one could ever use it again, for he had devised every possible elaboration which the human mind could conceive. That remark applies equally to Laennec and his stethoscope.

But we must not suppose that his contribution to thoracic medicine was confined to an account of physical signs. That part, in point of space, took no more than a fraction of his book. The rest was given to individual diseases. At the start he made it clear that he thought very little of the theorists. He refused to divide diseases into genera or species: " Still less shall I endeavour to ascertain the primary, or as they are called, proximate causes of diseases.

XUM

The vanity of researches of this kind is sufficiently proved by the profound oblivion into which all theories of this nature have successively fallen. I shall content myself with describing the diseases of the thoracic organs—that is to say, such pathological phenomena as are well marked and easily distinguishable from others." With bacteriology still more than half a century ahead we can hardly deny that he was sound in his refusal to indulge in profitless speculation.

We might pick at random any one of his accounts of thoracic disease and find there today something which we did not know or had forgotten, or that illuminated some problem with which we had wrestled. To say this is to pay tribute again not only to his originality but to his artistic love of completeness. Take, for instance, the onset of acute bronchitis; here is what he has to say: " The pulmonary catarrh is usually preceded by coryza, which is an affection precisely similar of that pituitary membrane. After some days, or perhaps hours, and, in most cases, just as the stuffing of the nostrils begins to yield, the inflammation reaches the air passages. Its transmission to the larynx is indicated by a sense of uneasiness and irritation, or a titillation like that of itching, which provokes to cough; and if the mucous membrane is much affected there is hoarseness, and occasionally loss of voice. When the inflammation extends to the bronchi, there is sometimes a slight pain, more commonly a sense of dryness and roughness, behind the sternum or at its lower extremity. When the disease is very severe, there is greater, sometimes indeed very sharp though transient, pain extending over the whole chest, particularly after the fits of coughing. When the cough is violent, the patient also feels pain and weakness about the attachments of the diaphragm, along the borders of the ribs and in the back.

" The cough, at first dry, is soon accompanied by a serous expectoration which is saltish and slightly glutinous, but not distinguishable from the saliva with which it is intermixed. This, in adults, is usually intermixed with some small pearly sputa which is more or less tinged with the black pulmonary matter, and generally softer than those expectorated in the dry catarrh. As the disease advances, the expectoration becomes thicker and more yellow, and is intermixed with particles of an opaque whitish colour: by degrees the whole becomes opaque, of a pale yellow or slightly greenish hue, viscid, enclosing air bubbles, tasteless and somewhat saltish, and occasionally marked with dots, or small streaks of blood. The cough returns by fits, and is more or less frequent according as the expectoration is copious or otherwise; it is particularly troublesome on waking in the morning, and sometimes after meals." Here we see the quality of precise description raised to the status of genius in its capacity for taking pains.

So it is for everything which Laennec touched. His accounts of acute suffocative catarrh and of whooping-cough are masterpieces of clinical recording. He described bronchial dilatation, with chapter and verse, both in its acute and chronic forms, linking it with whooping-cough in childhood. He pointed out that " in cases even of the most extensive dilatation the symptoms rarely indicate the severity of the disease. Most commonly there is neither fever (at least continued fever) nor emaciation; and if the patient is not obliged to undergo severe bodily labour, he is scarcely sensible of any diminution in strength. Even the respiration is not impeded, except under the

influence of quick and rapidly renewed movements. The expectoration is not more characteristic. When the dilatation is very extensive, it is extremely copious. It is always mucous, but occasionally resembles the secretion in the last stage of acute catarrh, and is sometimes quite puriform. It is generally without smell, but occasionally has the odour of pus, of good or bad character. The secretion is sometimes so copious as to simulate the rupture of a vomica."

The account of emphysema, one of his best, earned from Rokitansky the remark that had Laennec done no more than this his name would have been immortal. It was not only new and complete, but it revealed to the full his remarkably fresh and fertile powers of clinical writing. Note, for instance, his way of lighting important facts in the following passage, giving them the same sort of visible reality conferred upon fictitious creations by a great novelist. "Both the local and general symptoms of pulmonary emphysema are rather equivocal. Dyspnœa being its principal feature, it is usually confounded under the name of asthma. The difficulty of breathing is constant, but is aggravated by paroxysms, which are irregular both in the period of their return and their duration; it is likewise increased by all the causes which usually increase dyspnœa, from whatever source arising: such as the action of digestion, flatulence in the stomach or bowels, anxiety, living in elevated situations, strong exercise, running, or ascending a height, and above all, the supervention of an acute catarrh. There is no fever, and the pulse is generally regular. In slight cases the complexion and habit of the body are little altered; but when the affection is more considerable, the skin usually assumes a dull earthy hue, with a slight shade of blue here and there. The lips become violet, thick and look swollen. In every case that I have met with there existed an habitual cough. Sometimes this was infrequent, slight, and either dry or attended with a trifling expectoration of a very viscid, greyish and transparent matter; at other times, it was more severe, returning in paroxysms, and accompanied by the usual mucous expectoration. In some cases the patients denied having either habitual cough or expectoration: but on watching them carefully, it was found that they coughed slightly, at least once or twice daily, and expectorated every morning a little of the viscid bronchial mucus above mentioned." He then describes the signs we know so well, associates the disease particularly with long-continued asthma, and points out that of all the forms of dyspnœa it is unquestionably that which affords to the patient the best prospect of long life.

We have already noticed some of the qualities of Laennec's writing—his sense of design, his regard for selection and emphasis, and his ability to describe his subject completely. To these we can add another: his powerful use of comparison. For instance, he likened the dry sibilant râle to the chirping of little birds, or at times to the sound of two oiled slabs of marble suddenly separated. A good example comes in his account of aortic aneurysm: "There are few diseases so insidious as this. It cannot be certainly known until it shows itself externally. It can hardly be suspected, even when it compresses some important organ and greatly deranges its functions. When it produces neither of these effects, the first indication of its existence is often the death of the individual as instantaneously as if by a pistol-bullet. I have known men cut off in this manner, who were believed to be in the most perfect health, and

who had not complained of the slightest indisposition." Here the aptitude of the comparison gives all the force to his description that the suddenness of the event confers in life.

But it is, perhaps, for his work on tuberculosis that Laennec's name is most justly praised. In March 1804 he gave the famous lecture in which, with one exception on the mode of healing of cavities, he incorporated his ideas on the disease. He started by confirming Bayle's views on the morbid anatomy of the tubercle, from its miliary form to the ultimate fibro-cavernous destruction of lung substance. He described the disease in other organs as recognised by the presence of tubercles, gave a list of the frequency with which these were affected, and stressed its insidious character. He pointed out the unity of tuberculosis as a diseased entity, with the softening of caseous material as its salient feature wherever found. Phthisis, until then confounded with many other diseases, was simply tuberculosis of the lungs, admitting that the cause was unknown, though not to be found in the long list of suspected disorders. It is true that he studied advanced phthisis in the main; had he begun with early lesions he could never have given proofs of his diagnostic contentions. And, in what is almost the most interesting part of his account, he dealt with the possibility of recovery, describing that form of chronic phthisis now known as the bronchitic form, where a long life is not infrequent, though disturbed by catarrhal symptoms. Laennec has sometimes been accused of starting disbelief in recovery; though he hardly did that, he admitted it was not an easy feat.

At the time his book appeared Laennec was a sick man, and his symptoms gave reason for thinking that the trouble was tuberculous. Michaud, his brother, and Bayle, his friend, had already died from the disease. With Laennec the diagnosis was less certain; and his cousin, a good judge, at any rate thought not. But Laennec determined to rest from his labours. He sought a long leave from the Necker Hospital, and on October 8, 1819, set out by chaise for his house, Kerlouarnec, at Ploaré on the beautiful coast near Quimper. There he stayed recuperating for two years—reading classics, studying the dialects and folk-lore of Brittany, riding, hunting and shooting whenever the weather permitted. He did a little practice locally among the poor, helping the country doctors, whom he taught to use the stethoscope. It is from this period that the story comes of the man believed to have a cavity in his lung and to be moribund from phthisis. Laennec, asked to see him, failed to find a cavity and thought the signs pointed to a pleural effusion. Two and a half pints of pus were let out, and the patient recovered.

By the summer of 1821 Laennec was so much better that his pressing desire to return to Paris could be fulfilled. He was far from rich; and a second edition of his book would be needed soon. Nor was his the temperament to remain secluded from medical interests when recovery made resumption possible. Also Corvisart had died; and in the following spring Laennec took his place at the Charité, resigning from the Necker. At the Charité he had twenty-six male and fourteen female beds, with two chief assistants, his cousin Meriadec and Victor Collin. His round began at 10 a.m. five days a week, and lasted about two hours. Often he drew as many as fifty students and post-graduates. He talked a great deal in Latin, still a common language among scientific men;

XUM

and reviews of his work appeared twice a year in the *Revue Médicale*, though they were never written by Laennec himself. Not until August of next year, 1822, was he elected Professor and Royal Lecturer at the College of France, and then only after difficulties. That year he gave his summer holidays to preparing lectures for the College; and from then until he left Paris for good he lectured there three days a week, in time covering the whole of medicine. By now his reputation was European and his practice large. On one occasion he went to see a wealthy Spaniard in Bordeaux for a fee of ten thousand francs and made, incidentally, one of his most brilliant diagnoses. Though no longer haunted by fear of poverty as he had been all his life, his industry still knew no bounds. Besides practice and teaching he examined candidates in the Faculty and was Physician to the Duchess of Berry, a Court appointment. When the first edition of his book became exhausted he started to prepare another; he changed the title and the order, added much new material, and in effect almost wrote a new work. This second edition appeared in the summer of 1826.

But Laennec was already a dying man. While correcting proofs he had fallen ill, with great weakness, fever and a sore throat, soon followed by diarrhœa and night sweats, a continuous discharge of pus from an infected upper molar socket, due perhaps to empyema of the antrum, and severe cough with fœtid sputum. The illness has been regarded everywhere as phthisis; but I find this a little difficult to believe. Though we shall never know, for there was no later necropsy, the sequence of events is more like that with which we are familiar from a lung abscess or suppurative pneumonia. The ominous symptoms told Laennec how matters stood; he made his will, put his affairs in order and prepared to go to his home, Kerlouarnec, once again.

This time his wife went with him, for he had married, two years before, a Madame Argou whom he had long known. Those years had been the happiest of his life, despite ill-health. On May 30, 1826, they left Paris together for the last time. In a small carriage bought for the journey, two days passed pleasantly enough, with Laennec fairly well. Then they were halted by the weather and after that were never free from trouble until they reached Brittany. Laennec suffered agonies, with an overturned chaise and three days' delay for repairs to add to the miseries of illness. Once he arrived safely hope of recovery returned for a time. But his malady worsened as the days wore on, and soon he was emaciated and at times delirious. On August 13, waking in the afternoon, he took the rings from his fingers and placed them on a table by his bedside, saying that it would soon be necessary for another to do this for him and he did not wish that anyone should have the trouble. A little later he died serenely. He was buried near the parish church, a place he would have chosen, for, as Hale-White said, " from his tomb the eye wanders far over grey, rugged cliffs and the wide, deep, ever-changing blue-grey sea."

Thus, in his quiet way, Laennec left the medical world to which he bequeathed so great a legacy. None would dispute the size or the quality of his achievements: they were admitted in his own day, they have been accepted ever since. Yet, great as they were, they have scarcely served to place him among illustrious Frenchmen in general estimation. This is a common fate for those who dominate the history of technical discovery: we know the ones in our own subject; of the others we are unaware. Laennec is no exception.

XUM

That he was contemporary with some of the most famous figures in his own profession is no excuse, for he outshone them all but a very few. That he was contemporary, too, with the vivid figures of the Napoleonic era is, perhaps, a more human reason for neglect. Yet he stands almost any test of greatness we care to apply immeasurably better than those crafty adventurers and covetous soldiery who left more pretentious but far less splendid claims to the admiration of posterity.

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MEETINGS OF SOCIETIES

JOINT TUBERCULOSIS COUNCIL

A MEETING of the Council was held on Saturday, November 20, 1943, in London.

The Chairman of the Council, Dr. James Watt, welcomed the appointment of Dr. H. Selby of Leicester and Dr. C. K. Cullen of London as representatives of the Tuberculosis Group of the Society of Medical Officers of Health and Dr. W. Sheldon as the representative of the British Pædiatric Association.

Nomination of Officers for 1944.—The following officers were nominated for 1944: Chairman, Dr. James Watt; Vice-Chairmen, Drs. D. P. Sutherland and N. Tattersall; Honorary Treasurer, Dr. A. P. Ford (in succession to Dr. G. Jessel); Honorary Auditor, Dr. D. P. Sutherland; Honorary Secretary, Dr. Norman J. England (in succession to Dr. J. B. McDougall).

Reorganisation of the Tuberculosis Association.—A Report on this subject was presented to the Council by the Convener of the Committee, Dr. Norman England. There was a long and interesting discussion, but time did not permit a full and complete consideration on a number of the points on which there was a considerable difference of opinion. Much attention was given to that aspect of the Report which dealt with the re-organisation of areas and regions under which tuberculosis might be administered in the future. There was general agreement that periodic inspections by the Ministry of Health should be a matter of importance in future administration. It was suggested that the Report of the Notification Committee should be incorporated in the final Report of the Reorganisation Committee, and much the same feeling was

XUM

expressed with regard to that section of the Report dealing with thoracic surgery. Mr. J. E. H. Roberts agreed that the findings of his Committee would be forwarded with a view to incorporation. Considerable consideration was given to the qualifications of tuberculosis officers for senior posts, and Dr. Sheldon pleaded for special experience in dealing with children. In view of the importance of the Report and of the limited time for discussion of every item in detail, it was decided to refer the Report back to the Committee, and members of the Council were invited to write to the Convener and express to him any views which they may have on points already discussed and points remaining for discussion.

Shortage of Sanatorium Staff.—The Chairman reported on the discussions which had already taken place between representatives of the N.A.P.T., T.A. and J.T.C. on this question. In view, however, of the contemplated legislation by the Ministry of Labour it was felt that no action ought to be taken at present. The Council was informed that the Ministry of Health proposed to submit proposals which had been agreed upon by the Ministry of Labour and the Ministry of Health to the Standing Advisory Committee for further consideration.

Promin.—Professor W. H. Tytler promised to make a report on this matter at the next meeting of the Council.

Post-Graduate Classes.—The Convener, Dr. F. Heaf, gave a full account of the work of the Joint Educational Committee dealing with this subject. A General Practitioners' Course had been arranged in London for December 16 and 19, and further courses were contemplated for post-graduate and social workers in various centres—*e.g.*, Norwich, Cheshire, Liverpool, Wales and Cambridge. He referred to the fact that the Joint Committee felt that an investigation into the psychology of the tuberculous was worth considering and that his Committee might co-opt Colonel Dix, R.A.M.C., for guidance in this matter. Dr. Heaf reported that the Committee had agreed to provide two scholarships at the expense of the N.A.P.T. for almoners to the value of £25 each per annum. Dr. Sheldon advocated the holding of short courses dealing with tuberculosis in children.

Date and Place of Next Meeting.—The next meeting of the Council will take place in London on February 19, 1944.

PRESS NOTICE

A REFRESHER COURSE IN TUBERCULOSIS for tuberculosis officers and medical practitioners will be held in Liverpool on Monday, March 27, to Friday, March 31, inclusive.

The course is being arranged by the Joint Tuberculosis Council and National Association for the Prevention of Tuberculosis Joint Committee on Education, in collaboration with the City Public Health Department and the University of Liverpool. Details of lecturers and subjects will be announced later.

The Fee for the course is £4 4s., payable in advance. Early application should be made to Dr. Harley Williams, Tavistock House North, Tavistock Square, London, W.C.1, from whom all information may be obtained.